should grant that waiver request, and should grant CTSC's application for a construction permit for a new television station Channel *39 in Bakersfield, California.

Respectfully submitted,

Theodore D. Frank

George H. Shapiro

Paul J. Feldman

Arent, Fox, Kintner, Plotkin
& Kahn
1050 Connecticut Avenue, N.W.
Washington, D.C. 20036-5339

Counsel for
Community Television of
Southern California

September 11, 1989

Engineering Statement in Support of

PETITION FOR RECONSIDERATION

for a New Non-Commercial Television Station

Channel 39

Bakersfield, California

September 7, 1989

Hammett & Edison, Inc.
Consulting Engineers
San Francisco

NEW ETV STATION
CHANNEL 39
BAKERSFIELD, CALIFORNIA

STATEMENT OF DANE E. ERICKSEN, CONSULTING ENGINEER

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by Community Television of Southern California, licensee of Television Station KCET, Channel 28, Los Angeles, California, to prepare an engineering statement in support of a Petition for Reconsideration for waiver of the Advanced Television Systems freeze regarding the recent KCET application for a new non-commercial television station at Bakersfield, California.

BACKGROUND INFORMATION

In October, 1988, Community Television of Southern California filed an application for a new non-commercial television station on Channel 39 at Bakersfield, California, File Number BPET-881012KE. Channel 39 is allocated to Bakersfield as that community's only non-commercial channel. Because Bakersfield is within 280.8 km of Los Angeles, one of 30 communities subject to the Advanced Television Systems ("ATV") freeze, a waiver of the freeze was requested on three grounds: (1), that a waiver would allow providing the first over-the-air non-commercial television service to Bakersfield, a community with approximately 60,000 non-cabled television households which cannot now receive the signal of any educational television station; (2), that the proposed station would not affect possible future ATV operations in the Los Angeles area because of the existing preclusionary impact of TV Station KNSD, Channel 39, San Diego; and (3), that because of extensive terrain blockage between Bakersfield and Los Angeles, grant of the application would have no preclusionary impact on the possible use of Channel 39 at Los Angeles for ATV broadcasts.

Even though the July 16, 1986, FCC notice announcing the ATV freeze invited non-commercial television applicants to continue to apply on a waiver basis, the FCC declined to grant a freeze waiver, on the grounds that Channel 39 at San Diego did not necessarily preclude use of Channel 39 at Los Angeles, and that the ATV spectrum availability studies currently do not include consideration of intervening terrain. The Community Television of Southern California application for a new non-commercial television station at Bakersfield was therefore returned as unacceptable for filing.

TERRAIN BLOCKAGE

Figure 1 shows the locations of the proposed Channel 39 transmitter at Bakersfield, the existing Channel 39 at San Diego[1], and the Mt. Wilson antenna farm 25 km northeast of Los

[1] KNSD(TV) operates omnidirectionally with an effective radiated power of 5000 kW and a height above average terrain of 576 meters.

Angeles. The Mt. Wilson antenna farm is used by most of the Los Angeles market television stations; currently there are 7 VHF television stations and 8 UHF television stations transmitting from Mt. Wilson. The Mt. Wilson antenna farm is also the Los Angeles television transmitter site which is closest to Bakersfield.

The theoretical Grade B coverage of a maximum facility[2] UHF television station transmitting from the Mt. Wilson antenna farm is also shown. An omnidirectional pattern has been conservatively assumed, even though a directional pattern with its main lobe toward the heavily populated Los Angeles basin would undoubtedly be built in actual practice. Within this theoretical contour, two rectangular grids have been added to the map. The southern grid is composed of 15 mile by 10 mile rectangles with 16 points. The northern grid is composed of coarser 20 minute by 20 minute rectangles with 14 points. A finer grid with more points was used in the Los Angeles basin because of the greater population, compared to the sparsely populated areas north of Mt. Wilson. To points on both grids, terrain profiles were computer derived both from the proposed Channel 39 site at Bakersfield and from KNSD, using the National Geophysical Data Center 30-second point topography database. Those profiles are shown in the attached Figures 2 and 3.

PREDICTION OF RECEIVED SIGNAL STRENGTHS

To evaluate the extent of any service from the Bakersfield or San Diego transmitters on Channel 39, detailed calculations have been made of the signal strengths to be expected at each of the various grid points for which terrain profiles have been prepared. The calculations of propagation loss have been based upon procedures developed by the National Bureau of Standards and others. The model used in our study is the TIREM II (terrain integrated rough earth) model. TIREM II uses terrain profiles to compute values of basic transmission loss. The model evaluates the profile between two sites and, based on the geometry of the profile, selects a mode of propagation. TIREM II is applicable to problems in the 40 MHz to 20 GHz band. The sub modules of TIREM II include various knife edge models, a rough-earth diffraction model, a line of sight model, and tropospheric scatter models. The sub-models are selected automatically by the system, as appropriate for each point being calculated, to take into account variations such as single and multiple knife edges, marginal Fresnel-zone clearance, line of sight with various degrees of clearance, and so forth. The TIREM II model is the most accurate available means of predicting signal strength when details of the terrain along the propagation path are known, as in the instant case.

[2] 2239 kW at 975 meters height above average terrain was assumed, with geographical coordinates and average terrain corresponding to the KNBC-TV tower at Mt. Wilson.

In 1983, the U.S. Department of Commerce released a "Master Propagation System Users' Manual", Code PB83-178624, based on work by the National Telecommunications and Information Administration ("NTIA"), Annapolis, Maryland, which provides information on the TIREM II method for prediction of radio propagation. Most of the propagation models used by TIREM II were taken from the earlier Technical Note 101, "Transmission Loss Predictions for Tropospheric Communication Circuits", also released by the U.S. Department of Commerce. The main difference is that TIREM II computes a single result for propagation loss to each point based upon computer selection of the best model; the results from TIREM II are therefore unbiased, in contrast to those obtained from Technical Note 101, which is essentially a cook book from which various path-loss recipes can be taken. Technical Note 101 results therefore depend heavily on the judgment of the engineer using those 1966 methods.

TIREM II computes the median basic transmission loss in two steps. First, the terrain profile is examined by the computer and an initial mode of propagation is selected based on the path geometry. The model then branches to the appropriate subroutines that actually compute the loss. The parameter extractor processes the terrain profile to derive the information needed for the initial mode selection. These parameters include radio horizon distances, effective antenna heights, and path angular distances. Refractive effects of the earth's atmosphere are accounted for by using an effective earth radius at heights below 1000 meters and the Central Radio Propagation Lab exponential reference atmosphere at greater heights. Using the radio horizon distances calculated by the parameter extractor, the initial mode selection is made based on whether the given path is within the horizon or beyond it. The final determination of propagation mode is based on a number of parameters such as Fresnel clearance. There are 12 different propagation modes considered by TIREM II.

PREDICTION RESULTS

The results of the calculations are tabulated in Figure 4. It can be seen that, for every point on both grids, the proposed Channel 39 signal strength would either be less than 19 dBu[3] or would be weaker than the signal from KNSD. It is therefore concluded that the preclusionary impact on

[3] The 19 dBu signal strength represents the most preclusionary case, being 45 dB weaker than the 64 dBu contour which defines Grade B service for UHF television stations. The 45 dB desired-to-undesired ("D/U") ratio is taken from Section 74.705 (d)(1) of the Commission's Low Power Television ("LPTV") rules governing protection of TV broadcast stations. This rule section requires that co-channel LPTV stations not operating on specified frequency offsets must demonstrate a 45 dB D/U signal ratio at the Grade B contour of the protected co-channel TV station. Stations electing to operate on a specified offset are allowed to meet a relaxed 28 dB D/U ratio. To be conservative, the more stringent 45 dB ratio was used for this showing, even though there is every reason to expect that future ATV stations would employ offset operation.

Channel 39 which now exists because of KNSD would not be increased in any way by the use of Channel 39 in Bakersfield as proposed.

SUMMARY

The attached engineering profiles and terrain blockage calculations demonstrate that a grant of the proposed Channel 39 facilities would not impact on the possible future use of Channel 39 in the Los Angeles basin, either because of extensive terrain blockage or because the existing signal of KNSD is already significantly stronger than the proposed Channel 39 signal. A waiver of the ATV freeze would therefore not have any preclusionary impact on possible future ATV service in Los Angeles, and it would allow Bakersfield to receive its first over-the-air non-commercial television service.

LIST OF FIGURES

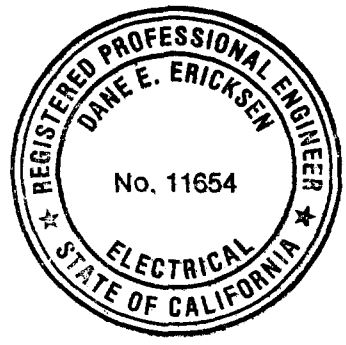
In carrying out these engineering studies, the following attached figures were prepared by me or under my direct supervision:

1. Map showing coverage of assumed Channel 39 maximum facility UHF television station in Los Angeles and points where signal strengths were computed.
2. Terrain profiles, southern grid points
3. Terrain profiles, northern grid points
4. Tabulation of calculated signal strengths.

HAMMETT & EDISON, INC.
Consulting Engineers

Dane E. Ericksen, P.E.

September 7, 1989



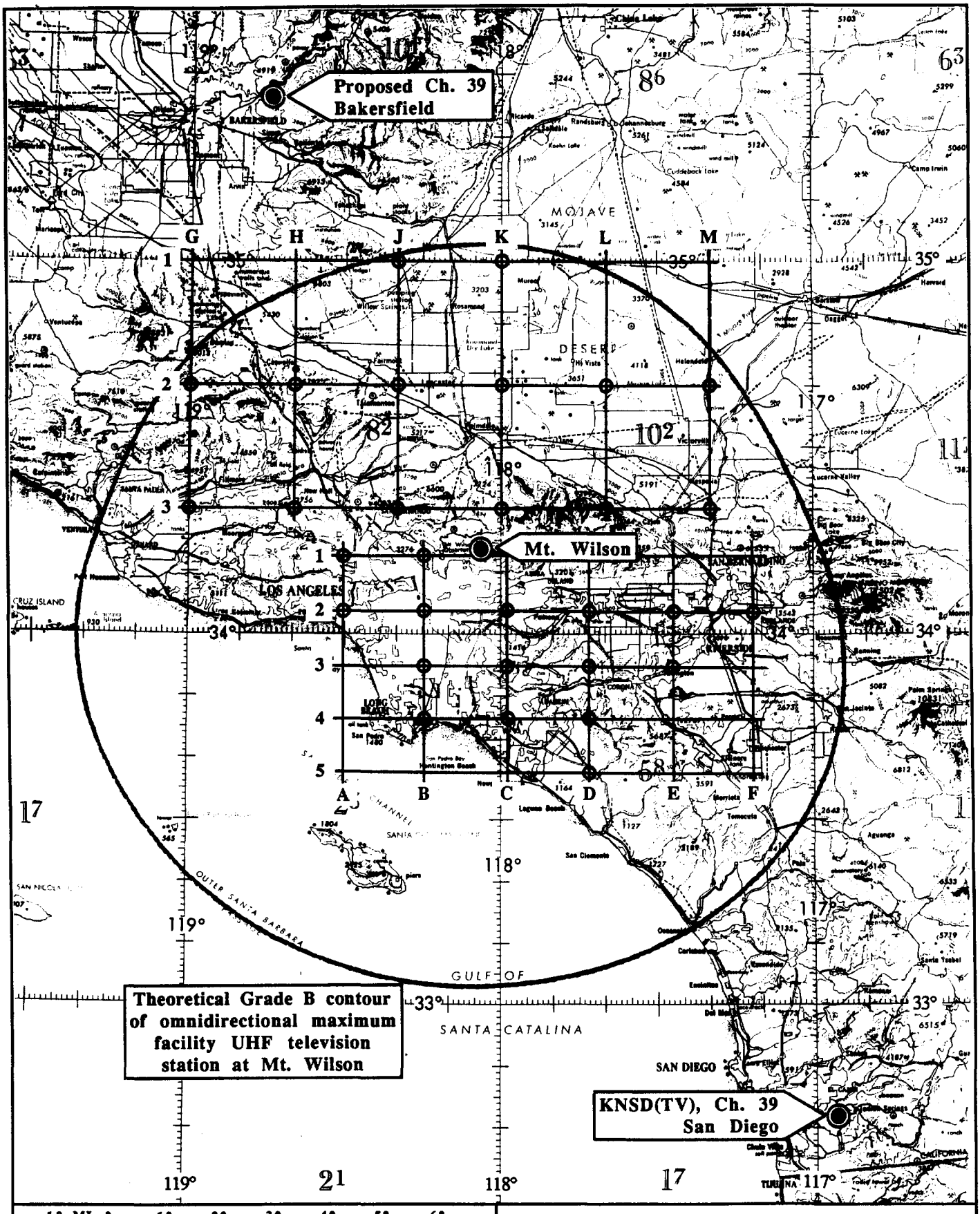
AFFIDAVIT

State of California)
) ss:
County of San Mateo)

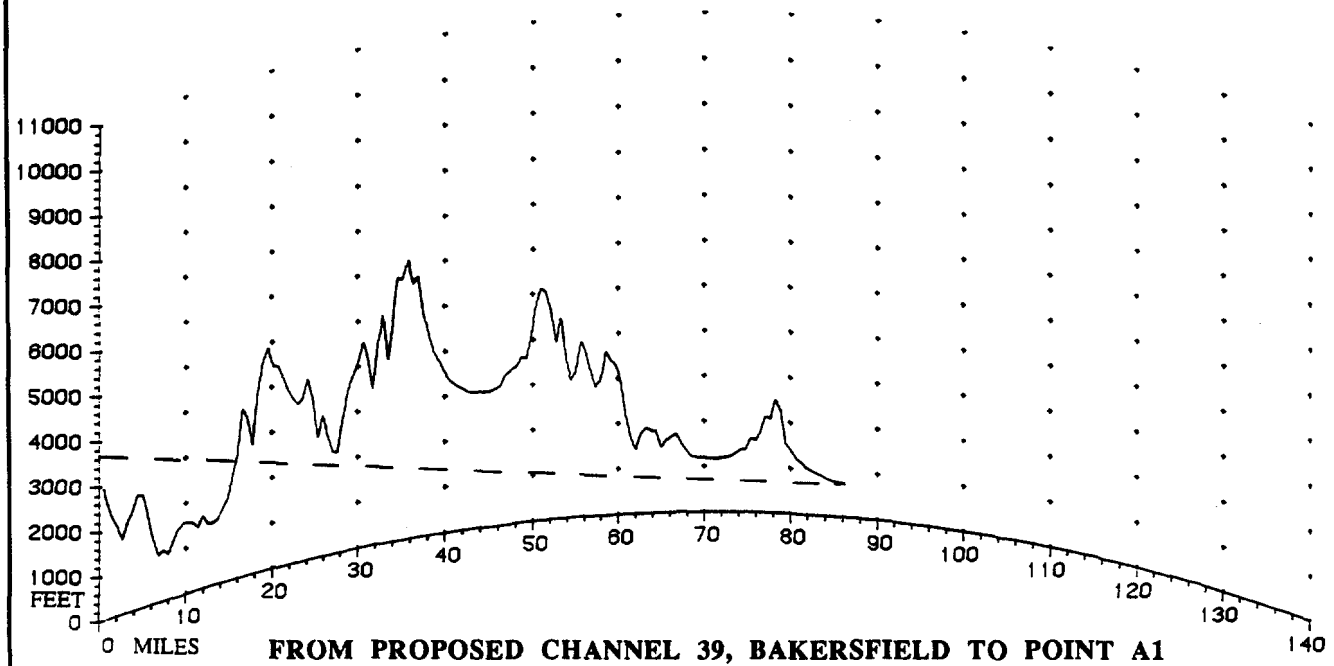
Dane E. Ericksen, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-003790 which expires on June 30, 1990, and is a principal in the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,

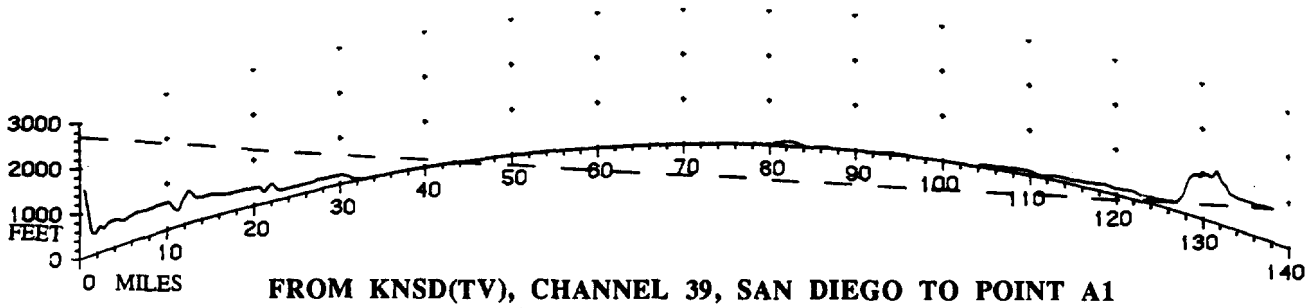
2. That he graduated from California State University, Chico, in 1970, with a Bachelor of Science Degree in Electrical Engineering, was an employee of the Field Operations Bureau of the Federal Communications Commission from 1970 to 1982, with specialization in the areas of FM and television broadcast stations and cable television systems, and has been associated with the firm of Hammett & Edison, Inc., since October 1982,



HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	**GRID POINTS**
	890810	FIGURE 1

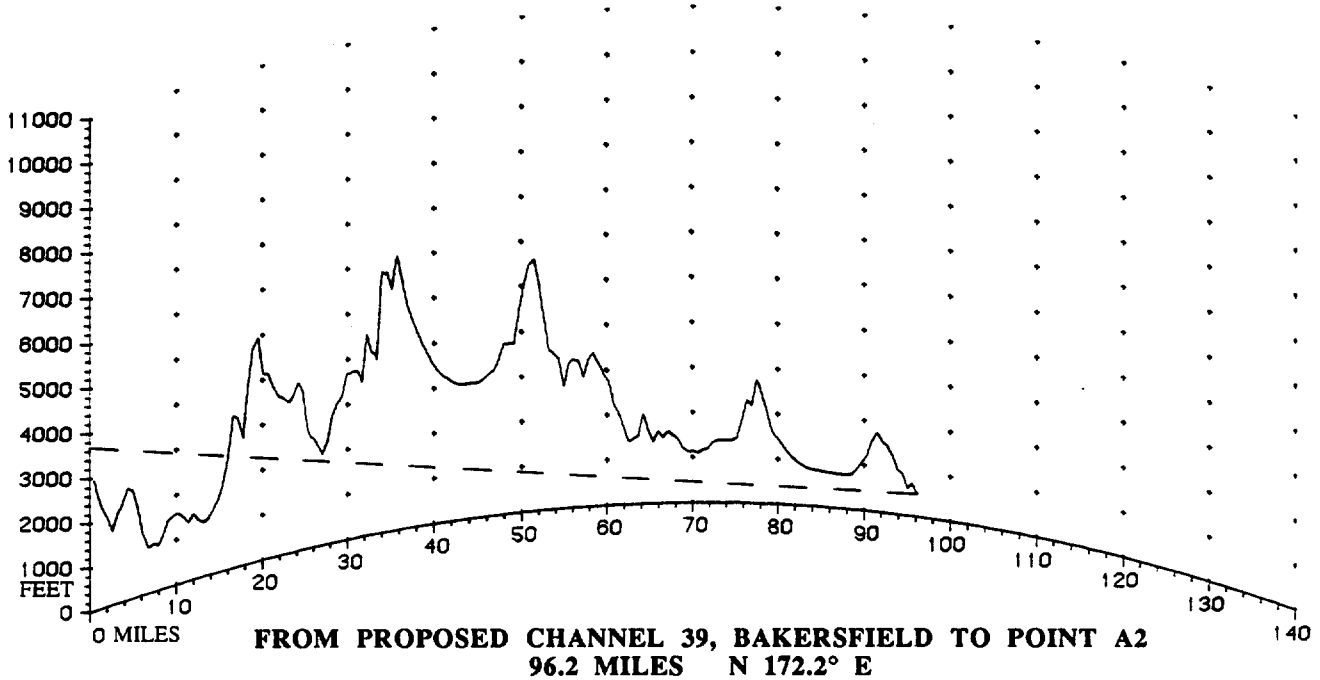


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT A1
86.3 MILES N 171.3° E

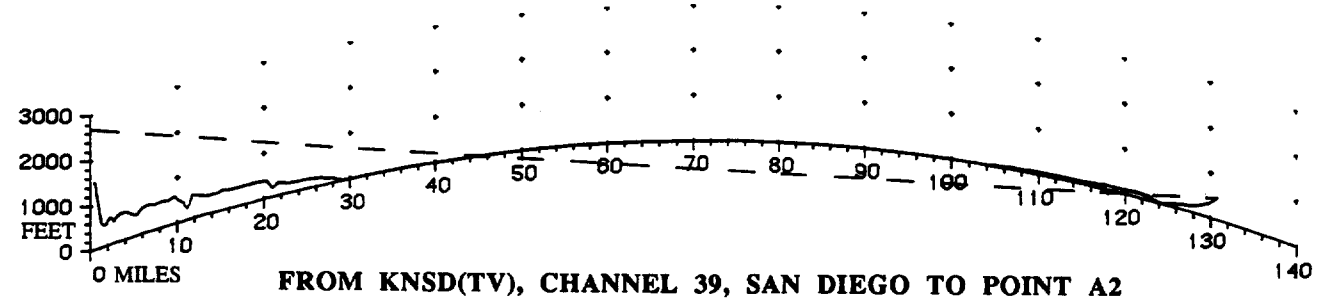


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT A1
138.1 MILES N 319.3° E

4/3 EARTH		**TERRAIN PROFILES POINT A1**	
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810	FIGURE 2A

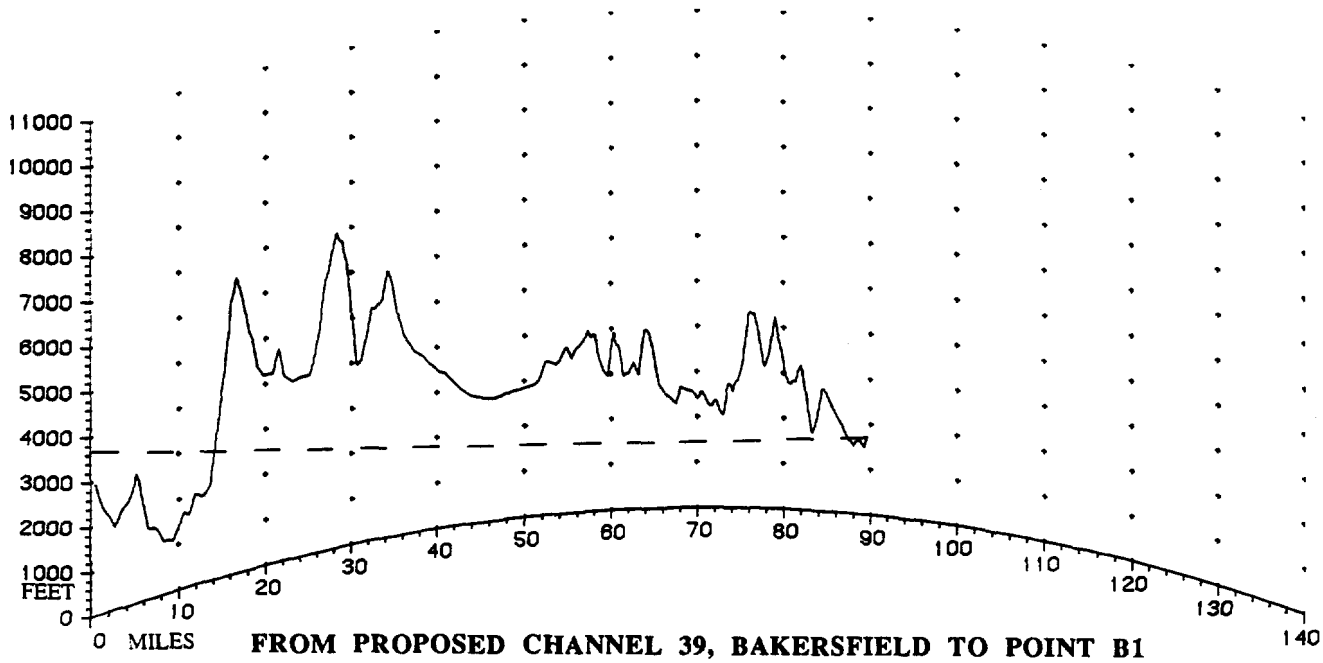


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT A2
96.2 MILES N 172.2° E

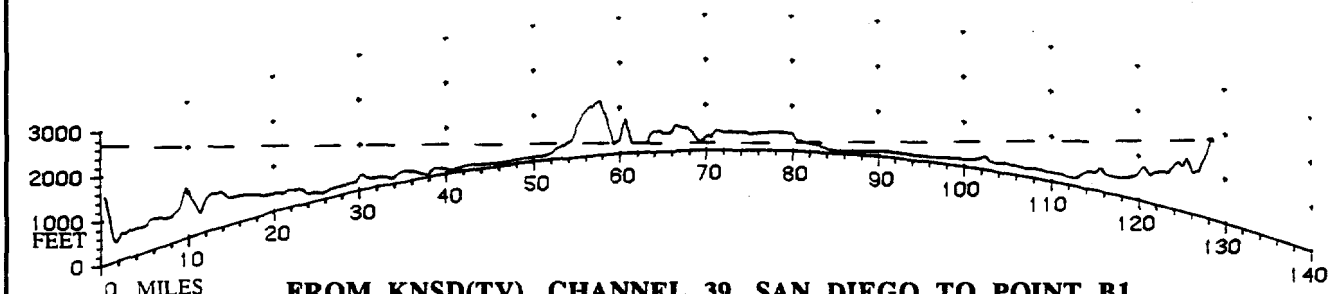


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT A2
130.8 MILES N 316.4° E

4/3 EARTH		**TERRAIN PROFILES POINT A2**	
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810	FIGURE 2B

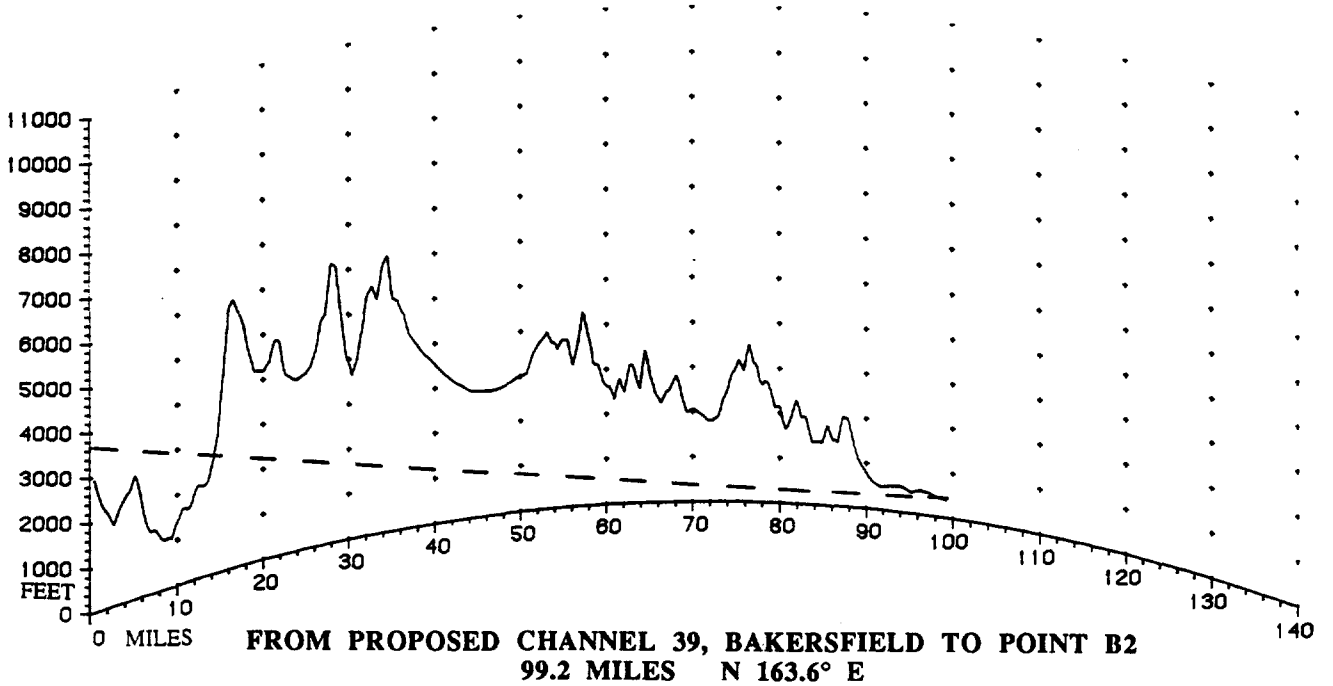


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT B1
89.6 MILES N 161.8° E

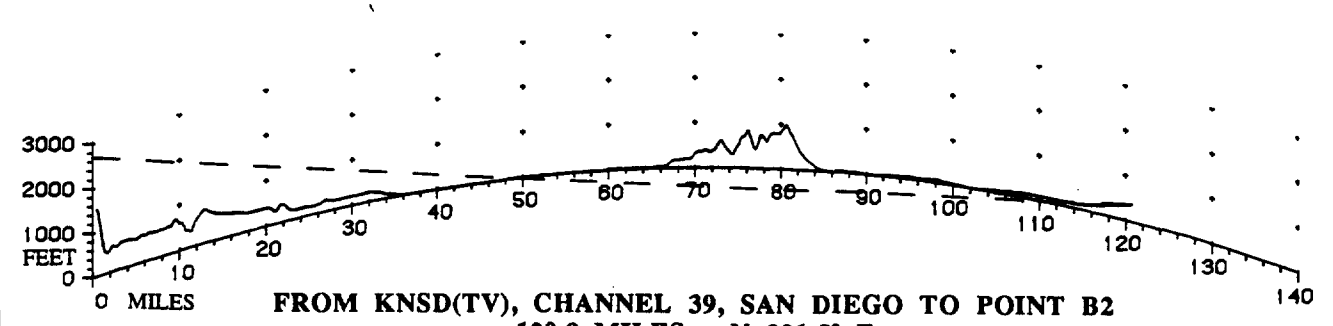


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT B1
128.7 MILES N 324.3° E

4/3 EARTH		**TERRAIN PROFILES POINT B1**
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 2C

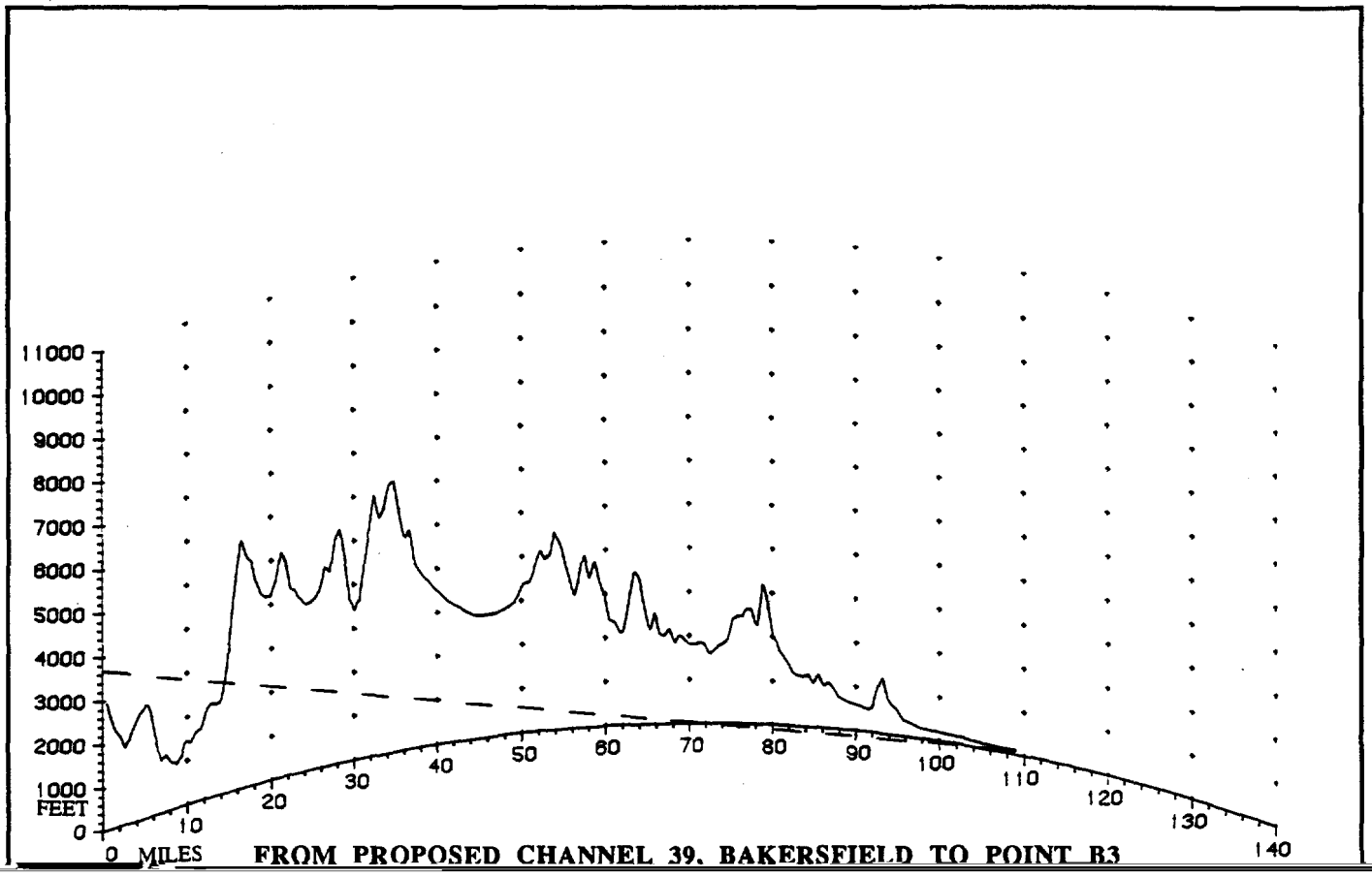


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT B2
99.2 MILES N 163.6° E

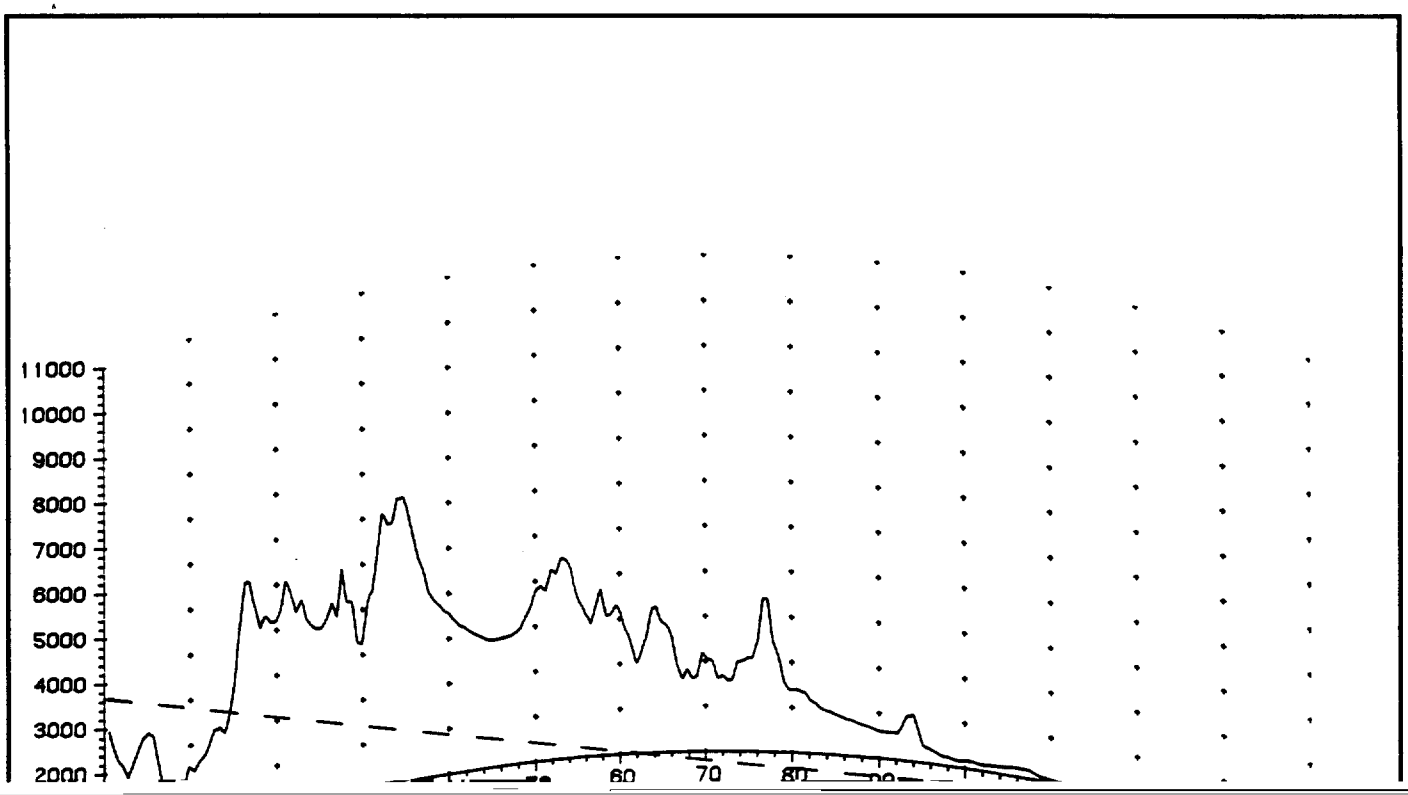


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT B2
120.8 MILES N 321.5° E

4/3 EARTH		**TERRAIN PROFILES POINT B2**	
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810	FIGURE 2D



FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT B3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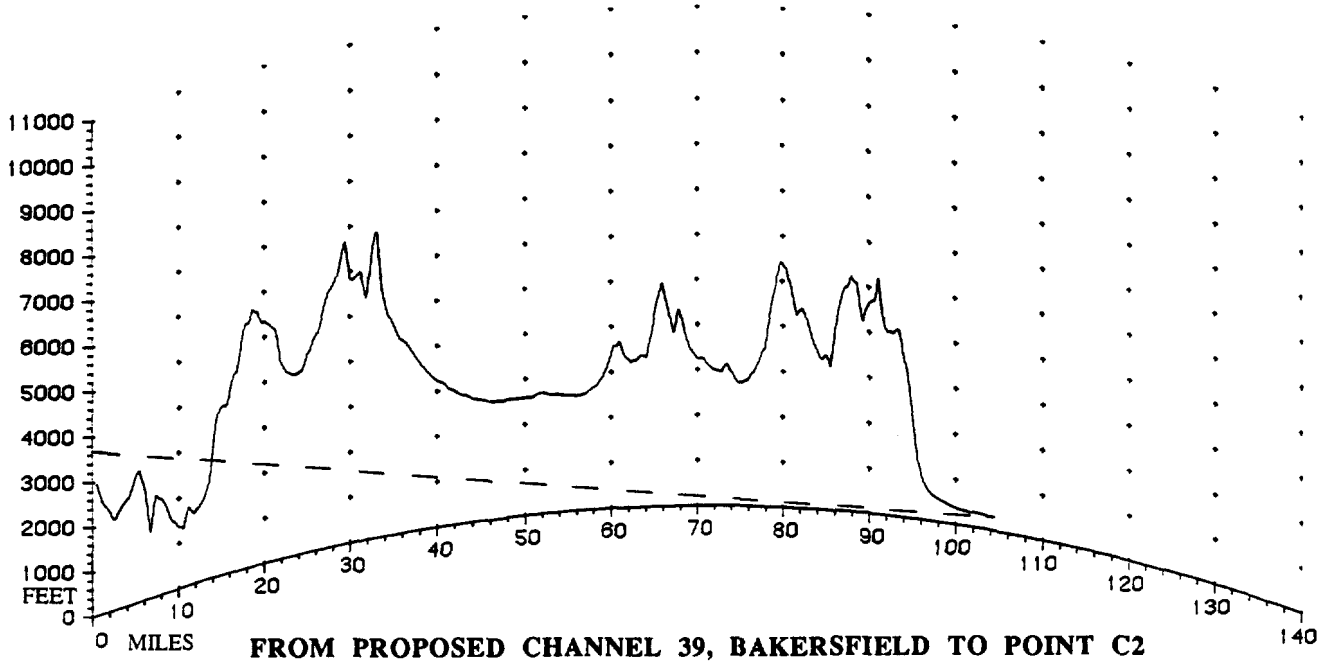
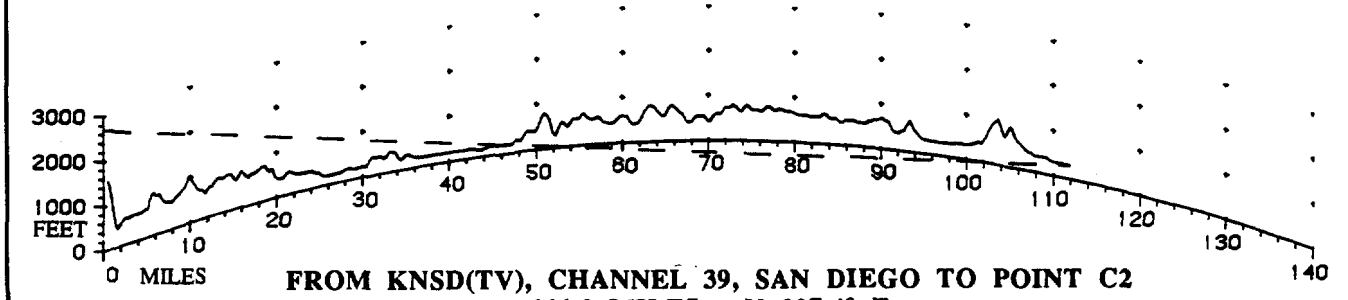
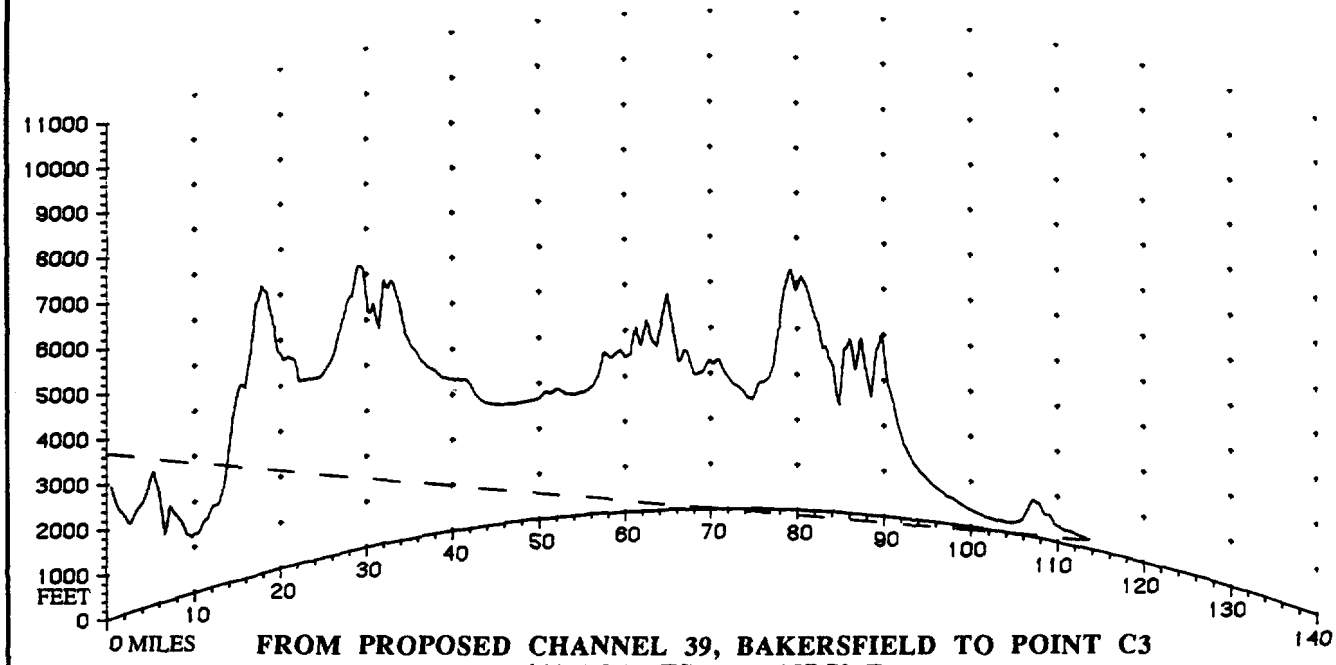


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT C2
104.4 MILES N 155.7° E

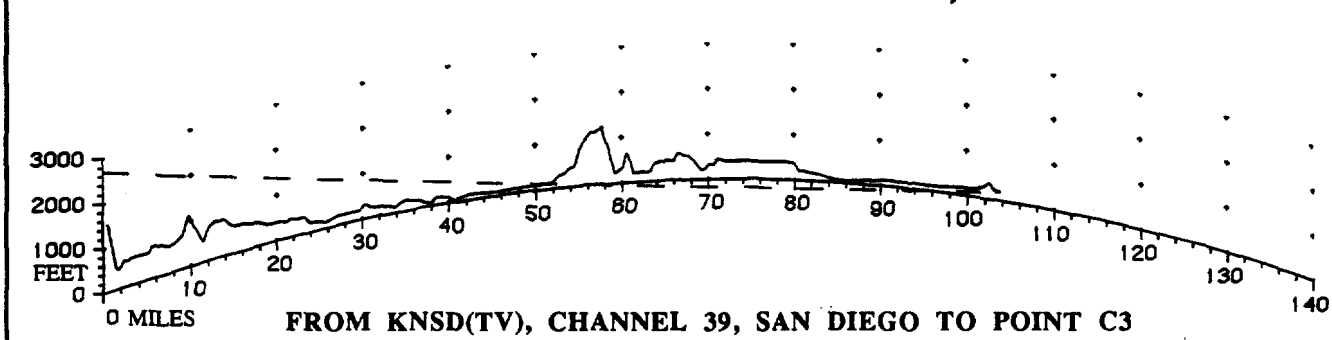


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT C2
111.9 MILES N 327.4° E

4/3 EARTH		**TERRAIN PROFILES POINT C2**
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 2G

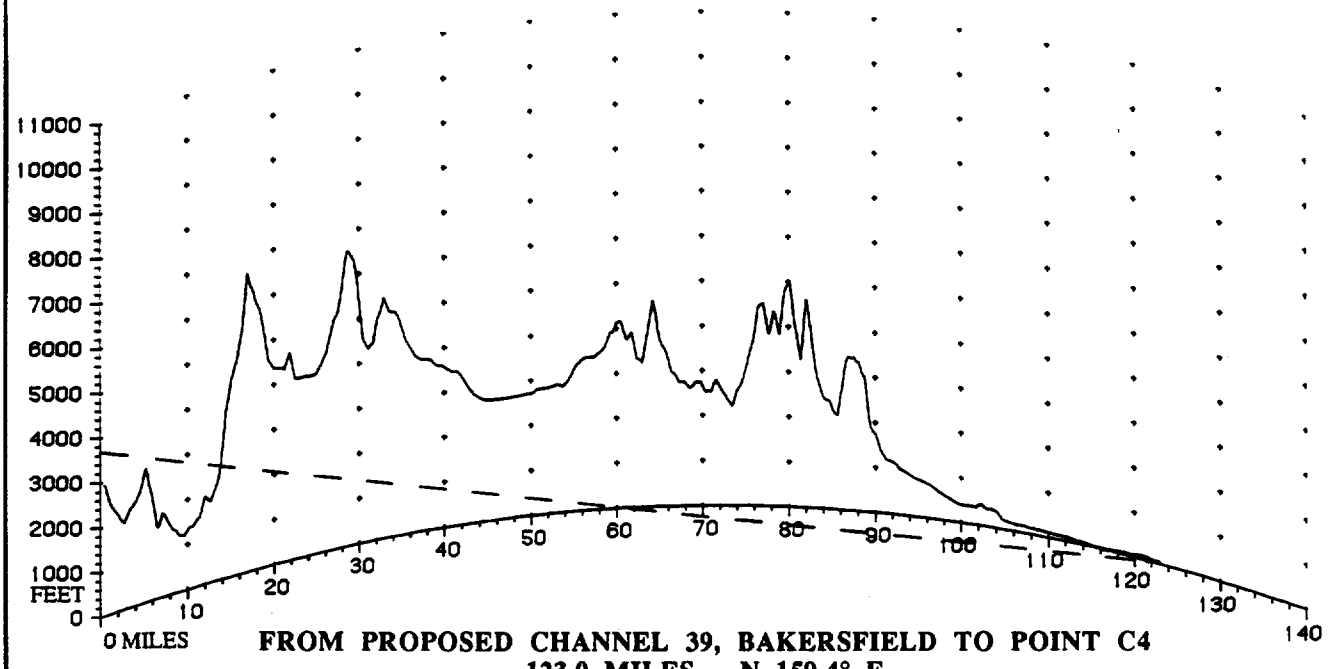


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT C3
113.6 MILES N 157.7° E

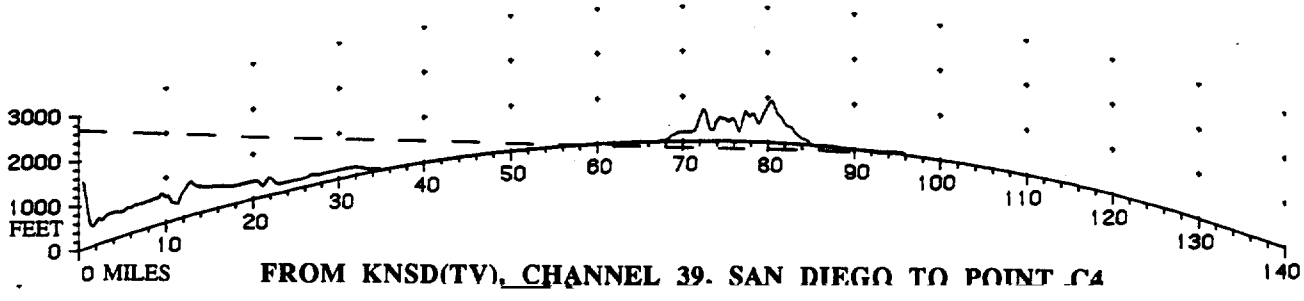


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT C3
103.7 MILES N 324.4° E

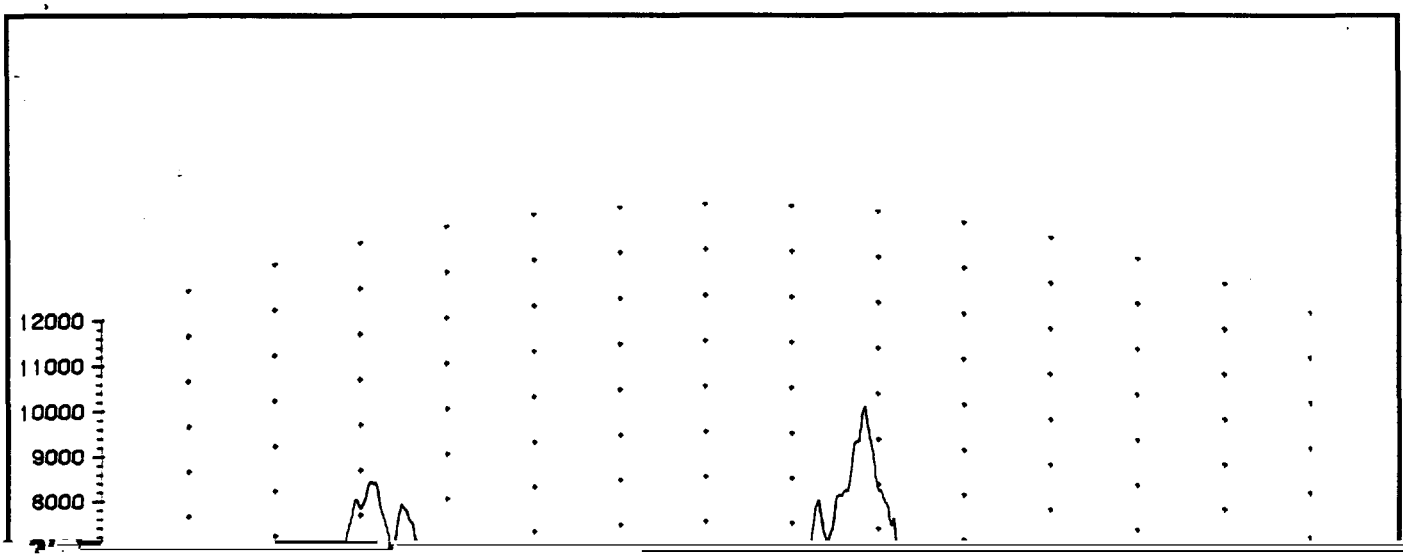
4/3 EARTH		**TERRAIN PROFILES POINT C3**
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 2H



FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT C4
123.0 MILES N 159.4° E



FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT C4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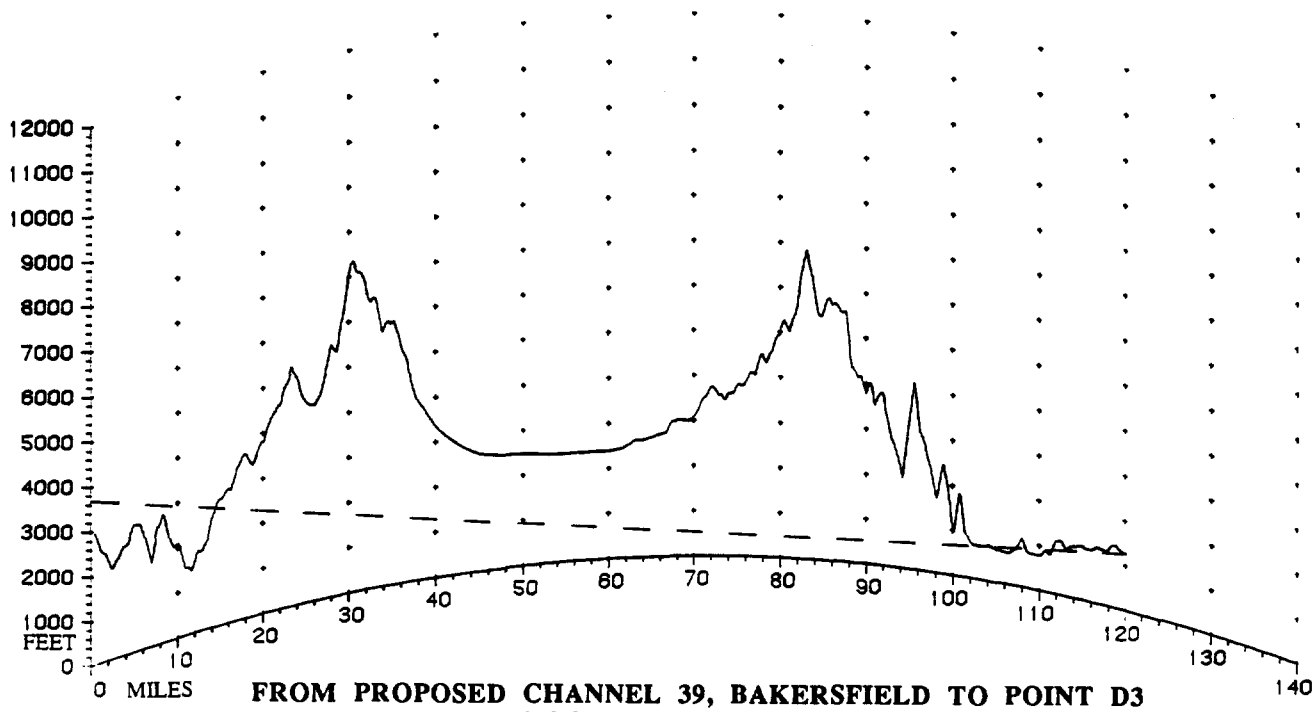
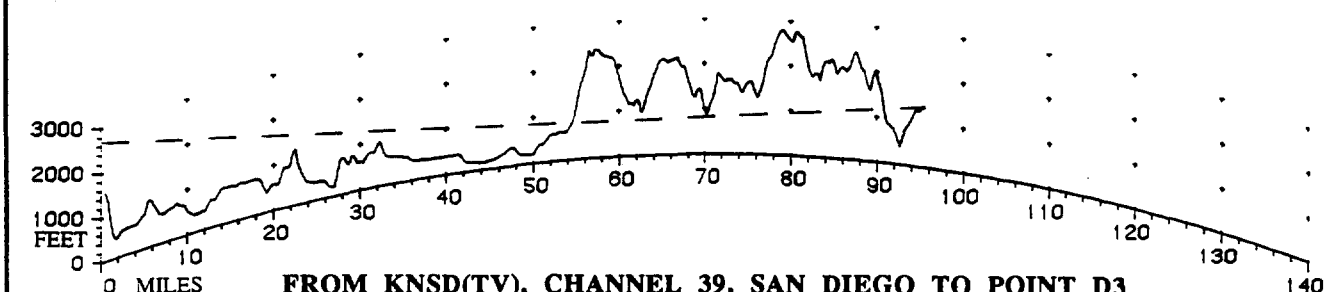
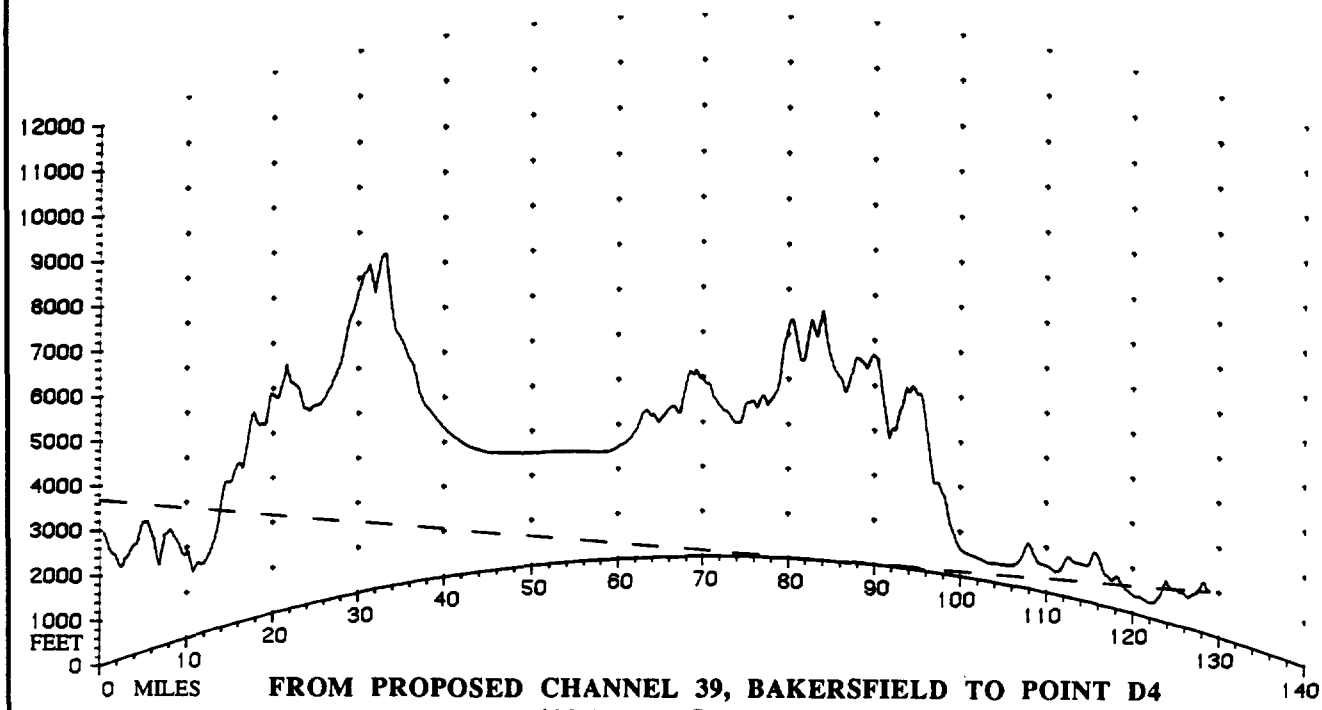


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT D3
120.0 MILES N 151.0° E

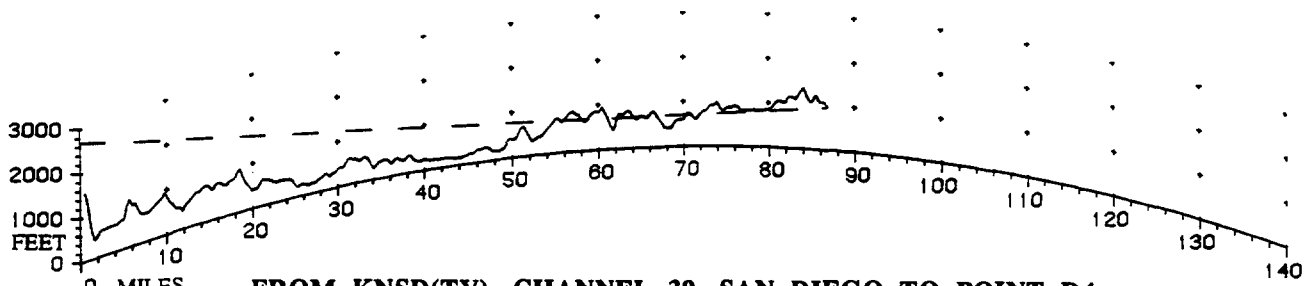


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT D3
95.5 MILES N 331.7° E

4/3 EARTH		**TERRAIN PROFILES POINT D3**
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 2L

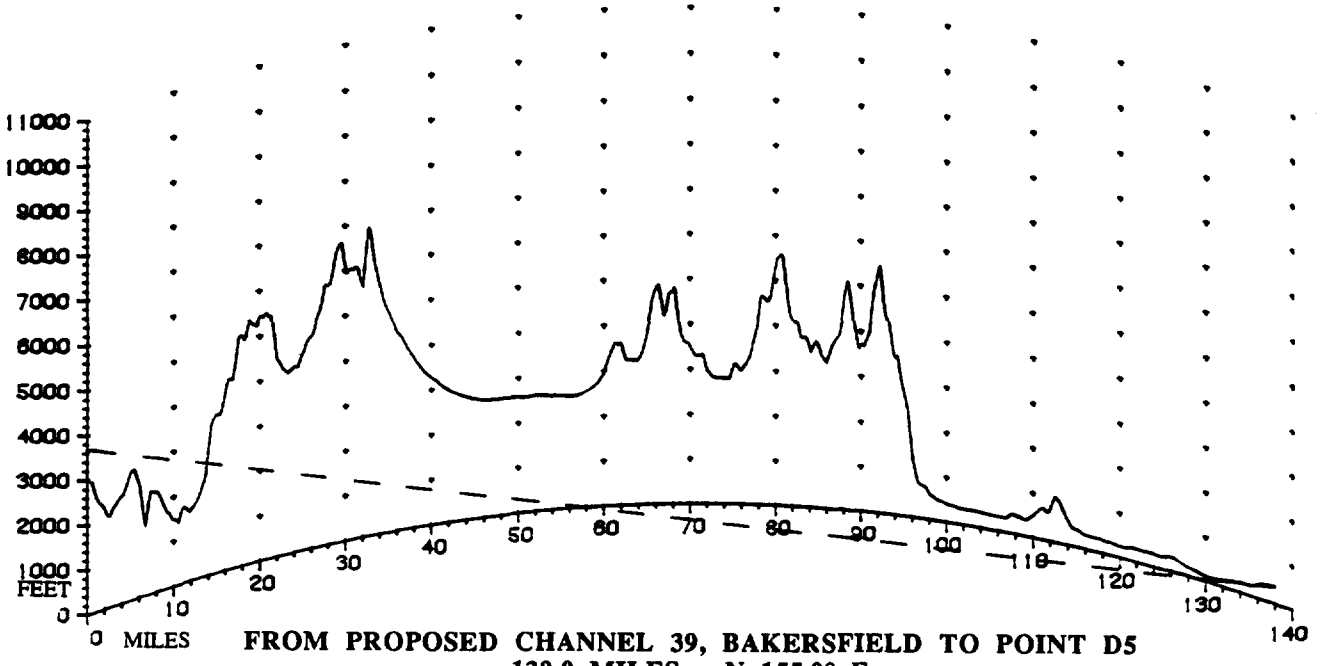


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT D4
128.5 MILES N 153.2° E

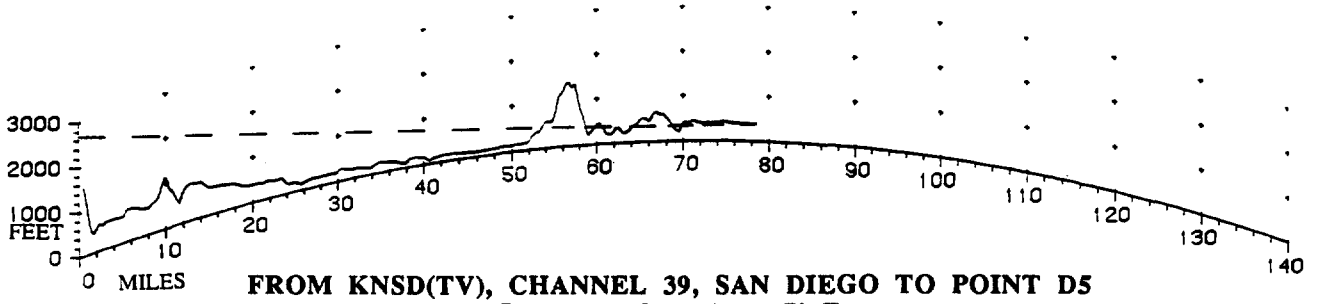


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT D4
86.9 MILES N 328.5° E

4/3 EARTH		**TERRAIN PROFILES POINT D4**
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 2M

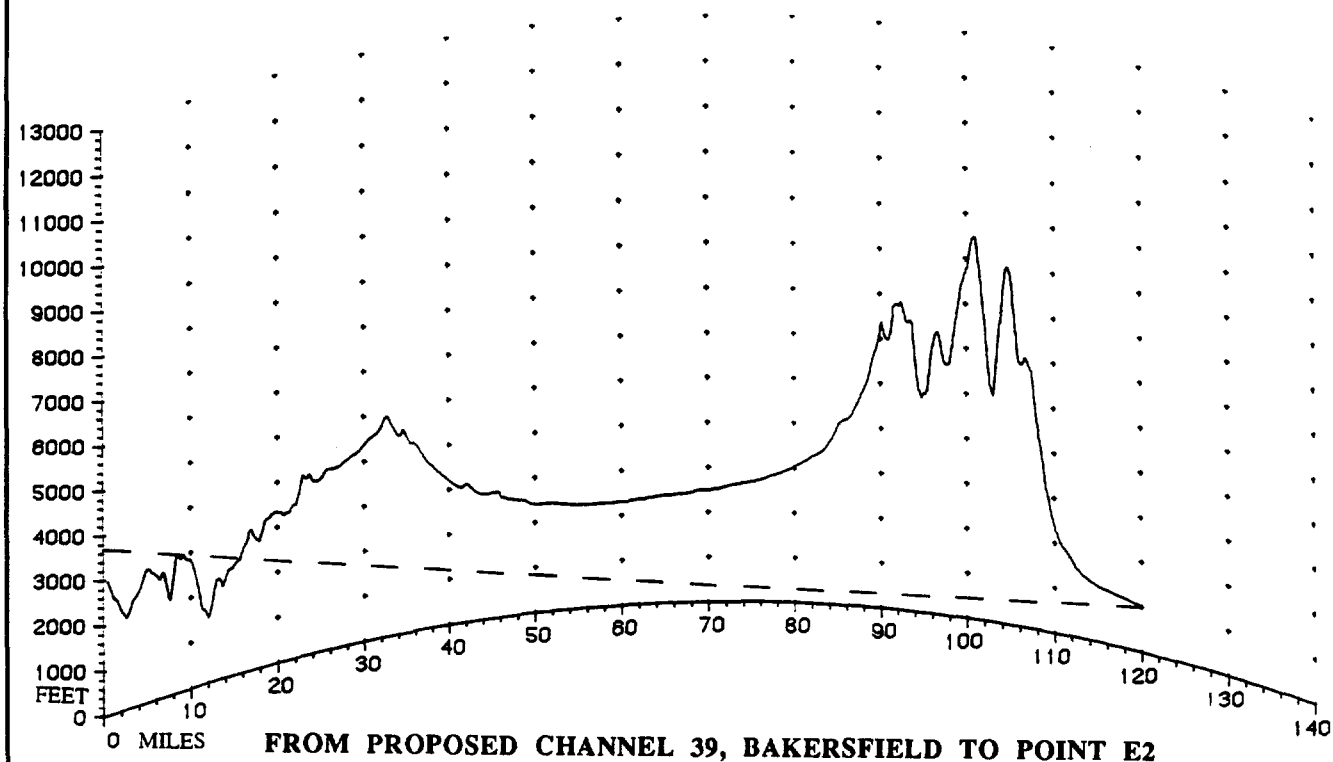


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT D5
138.0 MILES N 155.0° E

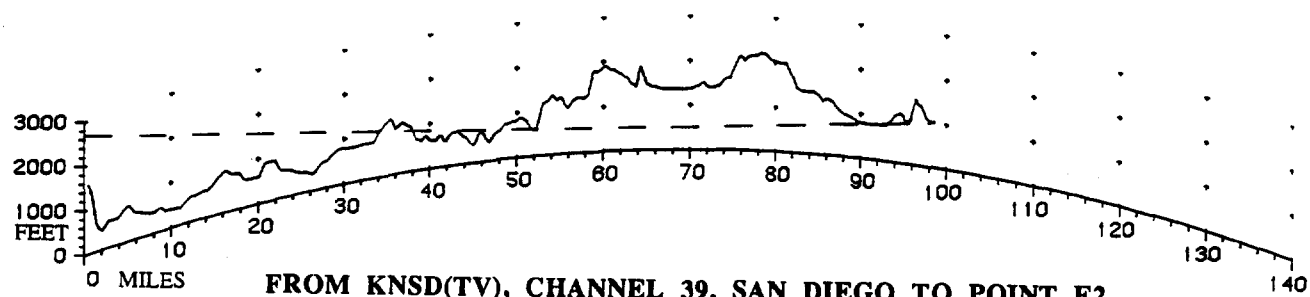


FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT D5
78.6 MILES N 324.7° E

4/3 EARTH		**TERRAIN PROFILES POINT D5**	
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810	FIGURE 2N

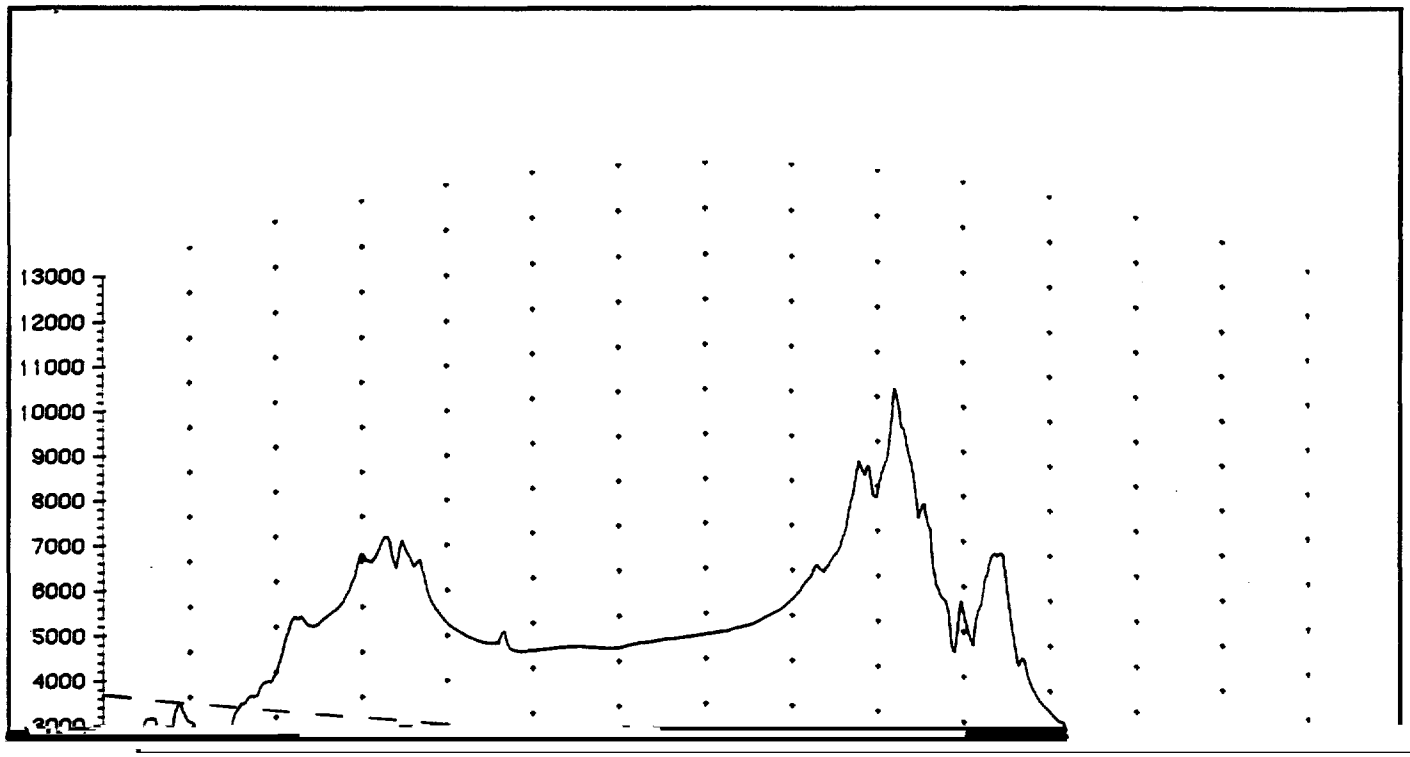


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT E2
119.8 MILES N 142.4° E



FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT E2
98.7 MILES N 342.2° E

4/3 EARTH		**TERRAIN PROFILES POINT E2**	
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810	FIGURE 2P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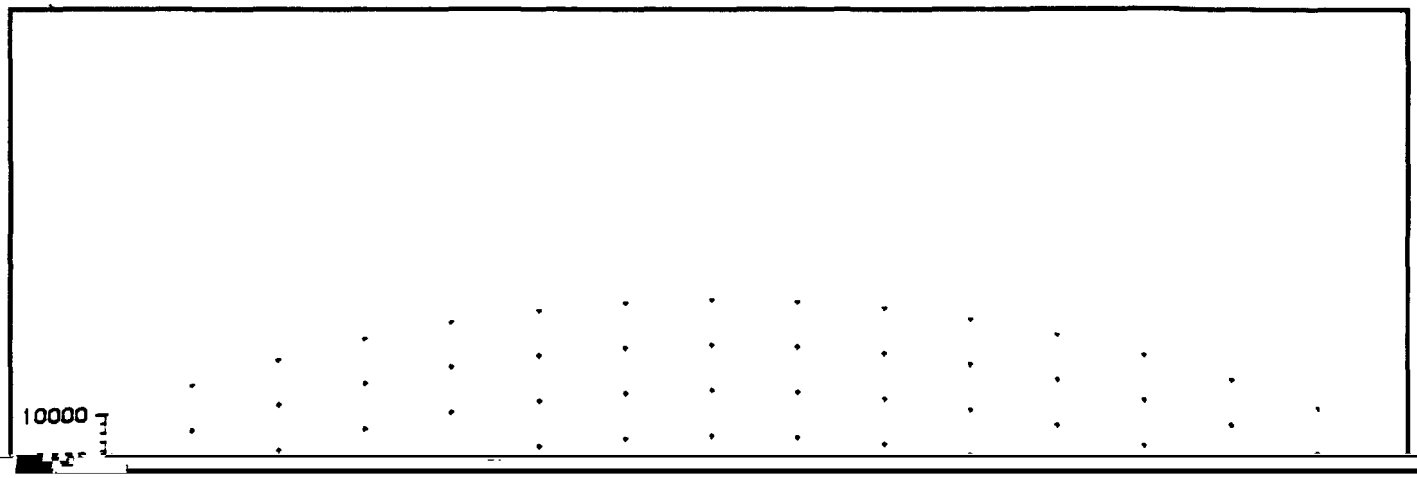
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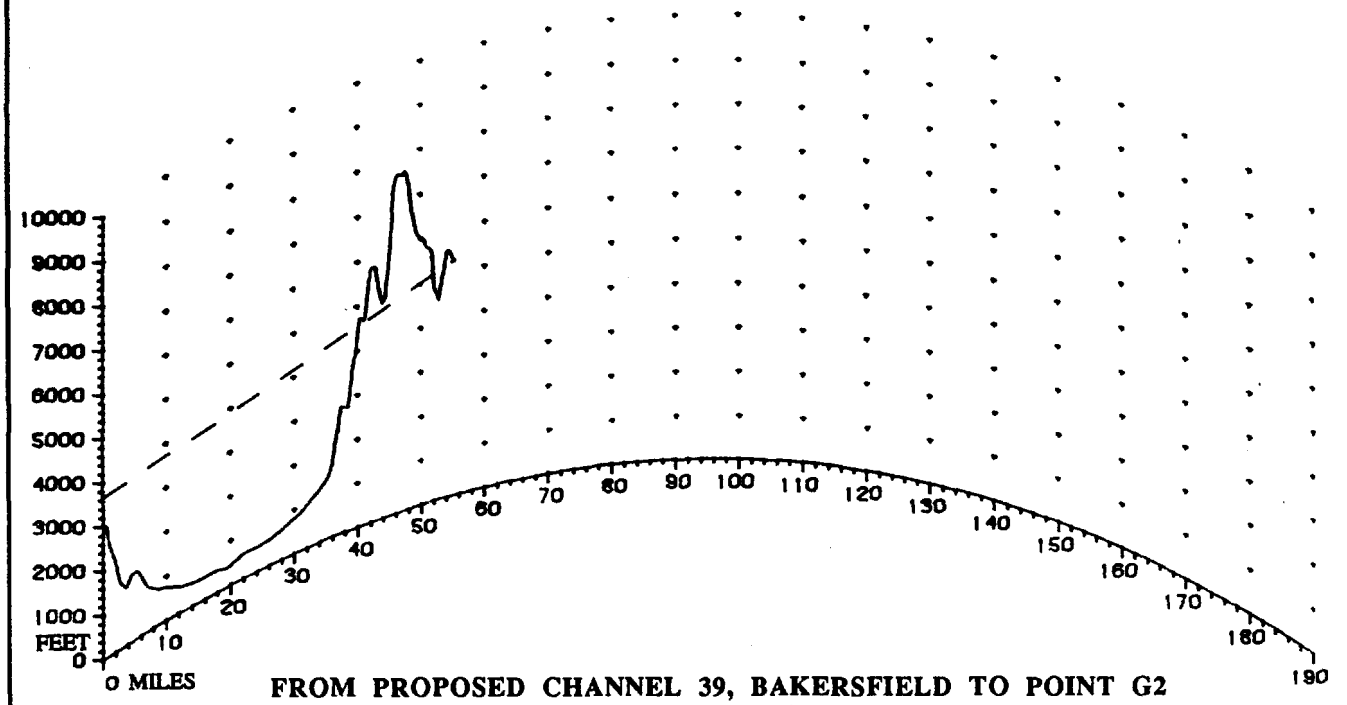
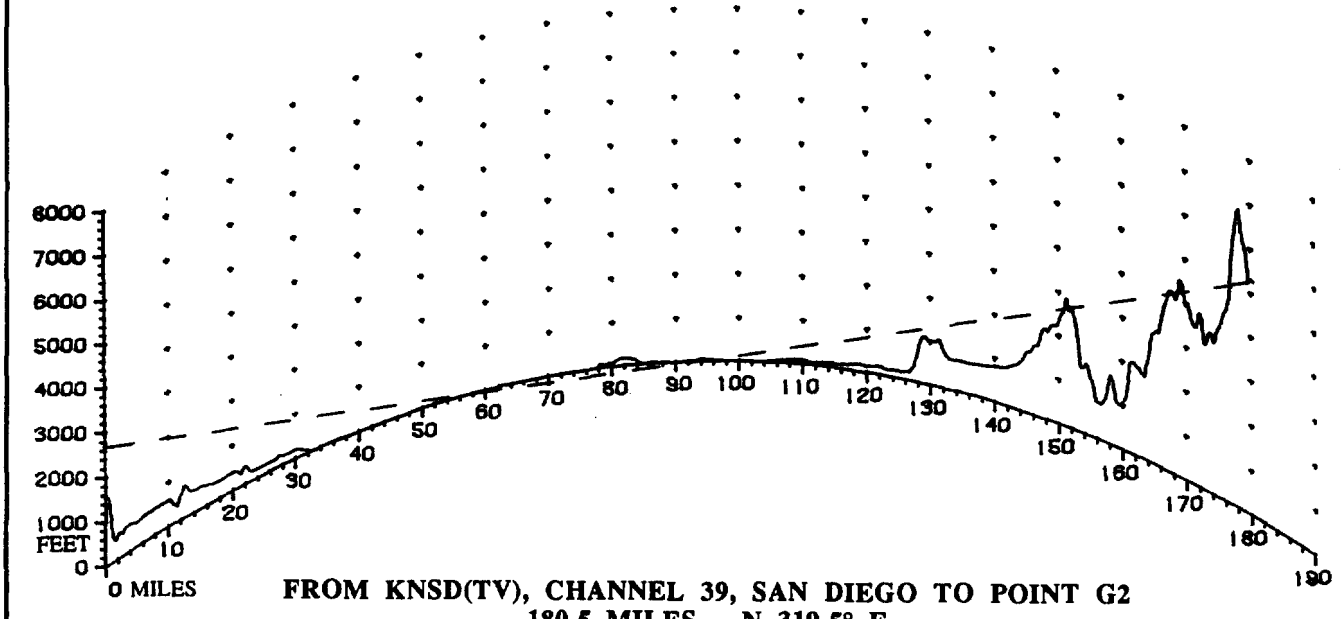


FROM PROPOSED CHANNEL 39, BAKERSFIELD TO POINT G2
55.3 MILES N 195.5° E



FROM KNSD(TV), CHANNEL 39, SAN DIEGO TO POINT G2
180.5 MILES N 319.5° E

4/3 EARTH		TERRAIN PROFILES POINT G2
HAMMETT & EDISON, INC. CONSULTING ENGINEERS SAN FRANCISCO	NEW ETV STATION CHANNEL 39 BAKERSFIELD, CALIFORNIA	890810 FIGURE 3A